

Clean Water State Revolving Fund FY12 Green Project Reserve

- Final -



Santa S & W District FY12 Wastewater System Project **SRF Loan #WW 1210 (pop. 150)** **\$565,306**

Final Green Project Reserve Justification **Business Case GPR Documentation**

RENOVATION OF GRAVITY WASTEWATER COLLECTION SYSTEM EXPERIENCING EXCESSIVE I/I (Energy Efficiency). Business Case GPR per 3.5-4: *I/I correction projects that save energy from pumping, chemical usage and WWTP capacity and are cost effective (\$565,306).*

RENOVATION OF GRAVITY WASTEWATER COLLECTION SYSTEM¹

Summary

- Renovation of the District's gravity wastewater collection system to reduce excessive inflow and infiltration (I/I).
- Estimated loan amount = \$565,306
- Estimated energy efficient (green) portion of loan = 100% (\$565,306)



Background

- Rainfall and high groundwater levels occur annually in the spring and fall. During these 7 months the lift stations pump up to .23 MGD (= 48.3MG) resulting in 22 to 24 hour daily pump runtimes, and higher chemical usage at the STP. Average Daily Flow (ADF) during dry weather months is .014 MGD resulting in 1- 2 hour daily pump runtimes. So, total volume to be treated by a BPA = .23 - .014 = .22 MGD x 7mo x 30 da/mo = 45.4 MG.
- The project replaced 5,550 LF of 8" concrete sewer main with fused 8"HDPE pipe, 45 individual sewer service lines with new 4-inch PVC pipe, and 17 grade-block manholes with precast concrete manholes.

Results¹

- The project reduced wet weather flows by almost 75% (from .230 MGD to .057 MGD), and pump runtimes from 24 hours daily to 1 to 2 hours daily. Therefore 75% of the wet weather volume will not have to be pumped = .75 x 48.3 = 36.2 MG.

Analysis²

Cost Effectiveness

- To determine the overall cost effectiveness and energy savings of the selected alternative, it is compared to a Best Practicable Alternative (BPA). For I/I projects, the BPA consists of equalization of influent flow, followed by provision for additional downstream treatment of the increased wastewater I/I volume. The stored, equalized I/I volume would subsequently be transferred by metered pumping to the WWTP for treatment.
- The pipe replacement option is cost effective i.e. the BPA is more expensive and energy intensive. Capital costs: (i) BPA = $(45.4/31) \times \$2,452,750 = \$3,592,092$; (ii) Collection system piping replacement and manhole repair = \$565,306.

Energy Savings

- Existing lift station: reducing system I/I by 75% results in a direct reduction in energy consumption by the existing lift station during the months of high groundwater levels, for the 40 year life of the project = $(36.2/31) \times \$41,320 = \$48,284$.
- BPA: the selected alternative avoids pumping wastewater for 40 years from the equalization basin to the WWTP. The 40-year O&M pumping costs = $(45.4/31) \times \$937,460 = \$1,372,925$.

Conclusion

- Eliminating 75% of I/I in the collection system is GPR-eligible since energy is saved from reduced lift station pumping costs (75% lower for the existing lift station, and eliminating BPA energy costs), along with significantly reduced treatment costs. In addition, the I/I correction project is cost effective, incurring less capital cost than the BPA.
- **GPR Costs:** GPR-eligible energy savings = Existing LS. + BPA = $\$48,284 + \$1,372,925 = \$1,421,209$
 \therefore GPR costs = **\$565,306** (replacing 5,550 feet of gravity sewer pipe, 17 manholes, and 45 individual service lines)
- **GPR Justification:** The prioritized replacement of gravity sewer lines by the City as recommended in the Capital Improvement Plan is GPR eligible by a Business Case per Section 3.5-4 (Energy Efficient): *Infiltration/Inflow (I/I) correction projects that save energy from pumping and reduced treatment costs and are cost effective.*

¹ Santa Collection System Preliminary Engineering Report, Mountain Waterworks, February 2013

² Based on the GPR I/I analysis for the City of Cascade FY12 Wastewater Project.